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IRON DISCOVERIES IN THE STATE OF NEW YORK.

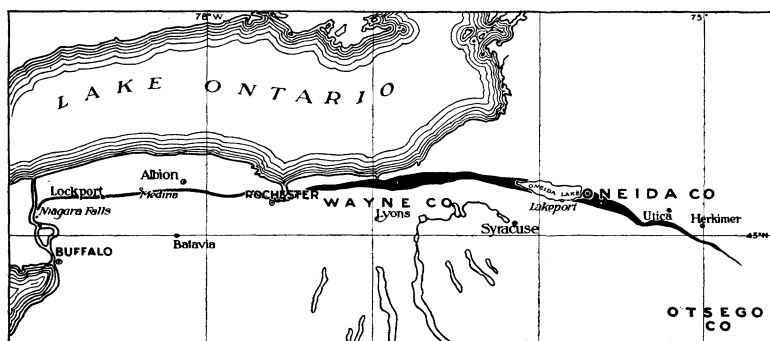
The important results of the investigations by Mr. D. H. Newland, Assistant State Geologist, and Mr. C. A. Hartnagel, Assistant in Economic Geology, of the iron ores of central New York, have been published as *Bulletin* 123 of the New York State Museum. The report, entitled "Iron Ores of the Clinton Formation in New York State," is of special interest, because it reveals the existence of large bodies of ore that had not been discovered until the present time. The investigations were carried on by continuous drilling during the autumn, winter, and spring of 1907-8 in a field where but slight effort has hitherto been made to estimate the volume of iron ore available for production. In his letter transmitting the paper for publication Dr. John M. Clarke, State Geologist, says that "the report conclusively indicates that in the region of Central New York there exists a commercial asset of great magnitude and vast importance to the people of this State." The investigations relate to a territory about 100 miles in length extending through the central part of the State from Oneida and Otsego counties on the east to Wayne County on the west. The Legislature made a special appropriation of \$5,000 for the work in the annual supply bill of 1907.

In a letter introducing the report, Commissioner A. S. Draper says:

I find much satisfaction in the assurance of the geologist that a conservative estimate, based upon this investigation, of the quantity of iron ore deposited in this region, places the amount at 600,000,000 tons. If this estimate is warranted, New York might yet easily become the leading iron State in the Union.

The Clinton formation comprises not only shales, limestones and sandstones, but also interbedded layers of hematite iron ore. The

hematites have been worked commercially, though with some interruptions, since the early part of the nineteenth century. A mining lease was granted in Oneida County in 1797 and a small quantity of ore was shipped from Wayne County during the war of 1812. Regular mining operations were not carried in until about 1825. A few years later, charcoal forges and furnaces were erected in Wayne, Madison and Oneida Counties, and for the past few years the production of Clinton ores has averaged about 75,000 tons. In 1907 it was 109,025 tons. The aggregate from the beginning may be placed at from 4,000,000 to 5,000,000 tons, which is approximately the yield obtainable, with the average workable seam, from a square mile of area. All the mining has been confined to the surface portions of the



OUTCROP OF CLINTON FORMATION IN NEW YORK.

beds and the mining interests have known nothing of the ores beneath the superficial deposits or of the greater part of the belt that is covered deeply under glacial débris.

While the present investigations were confined to the region in central New York between Otsego and Wayne Counties, the Clinton strata have long been known to extend from Otsego County to the Niagara River and thence for some distance into the Province of Ontario. The length of the belt within the limits of New York is about 225 miles and the width of the strata varies up to five miles. Utica is a little north of the outcrop, Rochester is near its southern edge, and Lockport stands on it. Rochester is the only place east of the Niagara gorge where the strata are exposed from base to top. The formation falls within the middle division of the Upper Siluric or Ontaric system.

It was found that the conditions throughout the belt facilitate exploratory operations with the drill and permit reliable deductions

from the data obtained. The ore seams maintain a fairly constant horizon in the series, so that there need be little error in estimating the depth at which they will be encountered in most places.

The exploratory work was performed entirely with a diamond core drill, by which means a core, one inch in diameter, representing a section of the rocks and ore penetrated, was secured. Eight holes were put down at intervals of about 10 miles between Verona Station, Oneida County, and Wallington, Wayne County. The details of the rock sections thus obtained are presented in tables. Only one test hole, that at Lakeport, gave indications unfavourable to the presence of any considerable body of ore. The ores belong to the red, earthy variety of hematite and the iron content is from 35 to 45 per cent.

In the calculation that the quantity of ore available in the region examined is approximately 600,000,000 tons, all ore was excluded that is below 18 inches thick or more than 500 feet from the surface. The larger part of the ore available for underground mining is in the western areas of Cayuga and Wayne Counties. The report says that the volume of ore is so large that "it must be considered as one of the important reserves in the present fields of iron mining. A great proportion, of course, will not be subject to profitable extraction for many years to come. But if limitations be put upon the estimate so as to bring it into relation more or less close with the existing status of the mining industry, the total will still be large." The report covers 76 pp. with three maps, a considerable number of photographs and a bibliography.

A GEOGRAPHIC INTERPRETATION OF NEW YORK CITY, PART III—(CONCLUSION).*

BY

F. V. EMERSON.

THE RAILROADS AND NEW YORK.—The period of about twenty-five years from the opening of the Erie Canal was one of great activity in canal building. Hundreds of miles were built, but most of the canals were to be abandoned before they could be brought to a paying basis. In most cases the competition of the railroad

* Part I printed in BULLETIN in October and Part II in December, 1908.